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Attorney Docket No. P2014

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF EXPRESS MAILING

I hereby certify that this paper and the documents and/or fees referred to as attached therein are being deposited with the United States Postal Service on July 21, 2000 in an envelope as "Express Mail Post Office to Addressee" service under 37 CFR § 1.10, Mailing Label Number EL391268058US, addressed to Assistant Commissioner of Patents, Washington, DC 20231.


Steve S. Cha

UTILITY PATENT APPLICATION TRANSMITTAL (37 CFR § 1.53(b))

Assistant Commissioner for Patents
Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing is the patent application under 37 CFR § 1.53(b) in the name of inventor(s) of:

Youn-Man Lee

For: METHOD FOR SAVING BATTERY BY CONTROLLING DISPLAY IN PORTABLE TELEPHONE.

Enclosed are:

Application Elements:

- ☒ 2 copies each of 3_ sheets of informal drawing(s).
- ☒ Assignment of the invention to: SAMSUNG ELECTRONIC CO., LTD.
- ☒ Specification, Claims, and Abstract: Nr. of sheets: 13
- ☒ A copy of combined declaration and power of attorney w/out signature

Accompanying Application Parts:

- ☒ A check* 1813 in the amount of \$690.00 for filing fee
- ☒ A Return Receipt Postcard
- ☐ Assignment and Assignment Recordation Cover Sheet (recording fee of \$40.00 enclosed)

- ☒ Claim of priority under 35 U.S.C. §119 and a copy of certified Korean Patent Application.
- ☐ Information disclosure statements: Nr. of sheets: 3
- ☐ Preliminary Amendment
- ☐ Small Entity Statement(s)
- ☐ Other:

The filing fee has been calculated as shown below (37 CFR §1.16):

For:	No. Filed	No.Extra	Rate(Small Entity)	Fee(Small Entity)
Basic Fee	20 claims			\$ 690.00
Total Claims	6 claims – 20 =	0	\$18(\$9)/claim	\$ 0.00
Independent Claims	3 claims – 3 =	0	\$78(39)/claim	\$ 0.00
Multiple Dep.Claims			\$130(65)/claim	\$ 0.00
Total Filing Fee				\$ 690.00

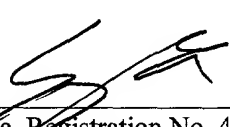
General Authorization for Petition for Extension of Time (37 CFR §1.136)

Applicant hereby make and generally authorize any Petitions for Extensions of Time as may be needed for any subsequent filings.

Should the enclosed check become lost or detached from the file, Assistant Commissioner is authorized to charge our Deposit Account No. 50-1005 and advise the undersigned attorney accordingly. Also, should the enclosed check be deemed to be deficient or excessive in payment, the Commissioner is authorized to charge or credit our deposit account and notify the undersigned attorney of any such transaction.

In view of the above, it is respectfully requested that this application be accorded a filing date pursuant to 37 C.F.R. §1.53(b).

Mailed: July 21, 2000


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METHOD FOR SAVING BATTERY POWER CONSUMPTION BY
CONTROLLING THE DISPLAY OF A PORTABLE TELEPHONE

CLAIM OF PRIORITY

5

This application makes reference to and claims all benefits accruing under 35 U.S.C. Section 119 from an application entitled "Method for Saving Battery by Controlling Display in Portable Telephone" filed in the Korean Industrial Property Office on July 21, 1999 and there duly assigned Serial No. 99-29511.

10

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to a portable telephone, and more particularly, to a method for saving battery power consumption by turning off the display unit of the portable telephone during a call connection.

2. Description of the Related Art

If the battery of a portable telephone has to be replaced frequently, it imposes a significant limitation on the usage of the portable telephone. Thus, it is desirable to provide a portable telephone with longer usage time by a given battery. Accordingly, the technology has evolved to contrive new novel batteries that are superior and have a longer lasting

lifetime. In addition to the development of the battery technology, many studies have been made on various methods of saving battery power by minimizing power consumption of the portable telephone.

5 Normally, a user holds the portable telephone to his/her ear during a call connection. Although the user does not pay attention to the display unit of the portable telephone during the conversation, the display unit is turned on in the existing portable telephone. In such a case, the display unit unnecessarily consumes the battery power even though the user does not and can not watch the display unit of the portable telephone during
10 the call connection.

15

20

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a method for saving a battery lifetime by controlling the display of a portable telephone in which the display is
5 turned off during a call in order to prevent unnecessary power consumption.

To achieve the above object of the present invention, there is provided a battery saving method of controlling the display unit of a portable telephone. The method comprises checking whether a user inputs a SEND key for a call origination or an
10 answering key in response to an incoming call; turning off the display when a call is set up according to the activation of the SEND key or the answering key; and, turning on the display when the call is terminated.

According to one aspect of the invention, the display is turned off when a
15 predetermined period of time has elapsed after the activation of the SEND key or the answering key.

BRIEF DESCRIPTION OF THE DRAWINGS

5 The above and other objects, features, and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a block diagram illustrating a portable telephone according to the
10 embodiment of the present invention;

FIG. 2 is a flow chart illustrating a procedure for controlling the operation of an LCD during a call origination according to the embodiment of the present invention; and,

15 FIG. 3 is a flow chart illustrating a procedure for controlling the operation of the LCD during a call termination according to the embodiment of the present invention.

20

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention will be described below with reference to the accompanying drawings. For the purpose of clarity, well-known functions or constructions are not described in detail as they would obscure the invention in unnecessary detail.

FIG. 1 shows a block diagram of a portable telephone according to the embodiment of the present invention. With reference to FIG. 1, a controller 111 controls the entire operation of the portable telephone, specifically the operating voltage supplied to the display unit according to the embodiment of the present invention. A duplexer 112 receives a radio signal from an antenna ANT and provides the received radio signal to a radio receiver 113. Similarly, the duplexer 112 transmits a transmission signal received from a radio transmitter 115 via the antenna ANT. The radio receiver 113 provides input data to the controller 111 during a data communication mode and provides an input audio signal to a voice processor 116 during a conversation mode. A frequency synthesizer 114 generates a local oscillation signal for demodulating the received signal under the control of the controller 111. Also, the frequency synthesizer 114 generates a transmission carrier signal and provides the generated transmission carrier signal to the radio transmitter 115. The radio transmitter 115 mixes the sound signal received from the voice processor 116 with the carrier signal received from the frequency synthesizer 114 and outputs the mixed signals to the duplexer 112 under the control of the controller 111 during the conversation

mode. The voice processor 116 demodulates the coded audio signal received from the radio receiver 113 and outputs the demodulated audio signal to a speaker SPK via a switch 117. Also, the voice processor 116 receives the electrical audio signal from a microphone MIC via the switch 117, encodes the electrical audio signal, and outputs the coded audio
 5 signal to the radio transmitter 115.

A ringer 118 generates a ring tone upon receiving a ring signal under the control of the controller 111. A memory 119 stores the control program of the controller 111. The memory 119 includes a Read Only Memory (ROM) for storing various programs, a Non-
 10 Volatile Memory (NVM) for storing telephone numbers and names, and a Random Access Memory (RAM) for temporarily storing data generated during the execution of the programs.

A key input device 121, a key matrix, has numeric keys for dialing and contains
 15 various functional keys. The key input device 121 generates a key input signal corresponding to the key selected by a user and provides the generated key input signal to the controller 111. A display 130 includes a Liquid Crystal Display (LCD) 131 and a back light 133. The display 130 displays the operating status of the portable telephone and is turned on/off under the control of the controller 111.

20

FIG. 2 shows a procedure for controlling the operation of the LCD during a call origination according to the embodiment of the present invention, and FIG. 3 shows a

procedure for controlling the operation of the LCD during a call termination according to the embodiment of the present invention.

First, with reference to FIG. 2, a detailed description will be made as to how to
5 control the LCD power of the portable telephone during a call origination according to the present invention.

Upon having the power-on in step 201, the controller 111 turns on the LCD 131 while the back light 133 of the display 130 is turned off in step 203. During the on-state,
10 the LCD 131 and the back light 133 are provided with the operating voltage from a battery (not shown), whereas during the off-state, the LCD 131 and the back light 133 are not provided with the operating voltage from the battery.

Then, the controller 111 checks in step 205 whether the user inputs (or presses) a
15 SEND key for a call origination using the key input device 121. When the SEND key is inputted, the controller 111 turns on the back light 133 for a predetermined period of time and maintains the on-state of the LCD 131. Otherwise, when the SEND key is not inputted, the controller 111 returns to step 203 to maintain the on-state of the LCD 131 and the off-state of the back light 133.

20

After step 205, the controller 111 checks, in step 207, whether a call is set up or not. When the call is set up, the controller 111 proceeds to step 213. Alternatively, the

controller 111 may proceed to steps 209 and 211 prior to proceeding to step 213. In step 209, the controller 111 checks whether a predetermined period of time has elapsed. If it is determined in step 211 that the predetermined period of time has elapsed, the controller 111 proceeds to step 213. Here, the predetermined period of time is defined as a time period
 5 required for the user to hold his/her portable telephone to his/her ear after dialing the phone number to make a call. In a normal usage behavior, a portable phone user presses the SEND key for a call origination then holds the portable telephone to his/her ear waiting for the call connection with the receiving party. Thus, the time required for this operation is arbitrarily determined.

10

Thereafter, in step 213, the controller 111 cuts off the operating voltage supplied to the LCD 131 and the back light 133 in order to turn off the LCD 131 and the back light 133. This is done to save the battery power by reducing the power consumption that is unnecessary to drive the display 130 during a conversation as the portable telephone is held
 15 to the user's ear that is out of the user's sight and the user does not and can not pay attention to the display 130.

When the user ends the call by pressing the END key in step 215 during which the display 130 is turned off, the controller 111 turns back the power supplied to the LCD 131
 20 but maintains the turn-off state of the back light 133 in step 217.

Next, a detailed description will be made as to how to control the LCD power

during a call termination with reference to FIG. 3.

Upon turning the power-on in step 301, the controller 111 turns on the LCD 131 and turns off the back light 133 of the display 130 in step 303. Then, the controller 111
5 checks in step 305 whether a ring signal for call termination is received. Upon detection of the ring signal, the controller 111 turns on the back light 133 for a predetermined period of time and maintains the on-state of the LCD 131, in step 307. At the same time, the controller 111 raises a call termination alarm. Otherwise, if the ring signal is not detected, the controller 111 returns to step 303 to maintain the on-state of the LCD 131 and the off-
10 state of the back light 133.

After step 307, the controller 111 checks in step 309 whether the user inputs a call answering key using the key input device 121 or other mechanism to receive the incoming call. When the call answering key is inputted, the controller 111 proceeds to step 315.
15 Alternatively, the controller 111 may proceed to steps 311 and 313 prior to step 315. In step 311, the controller 111 checks whether a predetermined period of time has elapsed. If it is determined in step 313 that the predetermined period of time has elapsed, the controller 111 proceeds to step 315. Here, the predetermined period of time is defined as a time period required for the user to hold the portable telephone to his/her ear to receive an
20 incoming call. Normally, the user activates the ANSWER key or other equivalent mechanism to receive a call termination then hold the portable telephone to his/her ear. Here, the time required for this operation is arbitrarily determined.

In step 315, the controller 111 cuts off the operating voltage supplied to the LCD 131 and the back light 133 in order to turn off the LCD 131 and the back light 133. This is done to save battery power by reducing the power consumption that is unnecessary to drive the display 130 as the portable telephone is held to the user's ear during the call and the user can not pay attention to the display 130 of the portable telephone.

When the user ends the call by pressing the END key in step 317, during which the display 130 is turned off, the controller 111 turns on the LCD 131 but maintains the turn-off state of the back light 133, in step 319.

The invention has been described with reference to the embodiment in which the operating voltage of the LCD 131 and the back light 133 are controlled during the call. However, when using an ear-microphone or a speaker phone, the portable telephone may continuously provide the operating voltage to the LCD 131 during the call.

As described above, the present invention gives an advantage of saving the battery power by cutting off the operating voltage supplied to the display when not in use during the call. While the invention has been shown and described with reference to a certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and detail may be made therein without departing from the spirit and the scope of the invention as defined by the appended claims.

WHAT IS CLAIMED IS:

1. A battery saving method of controlling the display of a portable telephone, comprising the steps of:

5 checking whether a user activates a SEND key for a call origination to establish a call or an ANSWER key in response to an incoming call;

deactivating the power supplied to the display when a call is set up according to the activation of the SEND key or the answering key; and,

activating the power supplied to the display when the call is terminated.

10

2. The battery saving method as claimed in Claim 1, further comprising the step of deactivating the power supplied to the display after the expiration of a predetermined time period if the SEND key or the ANSWER key is activated.

15 3. A method for saving battery lifetime by controlling the power supplied to the display unit of a portable telephone, comprising the steps of:

(a) determining whether an originating party has requested a call connection to a terminating party;

(b) deactivating the power supplied to the display if the originating party requests
20 the call connection to the terminating party; and,

(c) activating the power supplied to the display when the call connection is terminated.

4. The method as claimed in Claim 1, further comprising the step of deactivating the power supplied to the display after the expiration of a predetermined time period if the request to establish the call connection is made.

5

5. A method for saving battery lifetime by controlling the power supplied to the display unit of a portable telephone, comprising the steps of:

(a) determining whether there is an incoming call to the portable telephone from a third party to establish a call connection thereto;

10 (b) deactivating the power supplied to the display after receiving the incoming call to the portable telephone; and,

(c) activating the power supplied to the display when the call connection responsive to the incoming call is terminated.

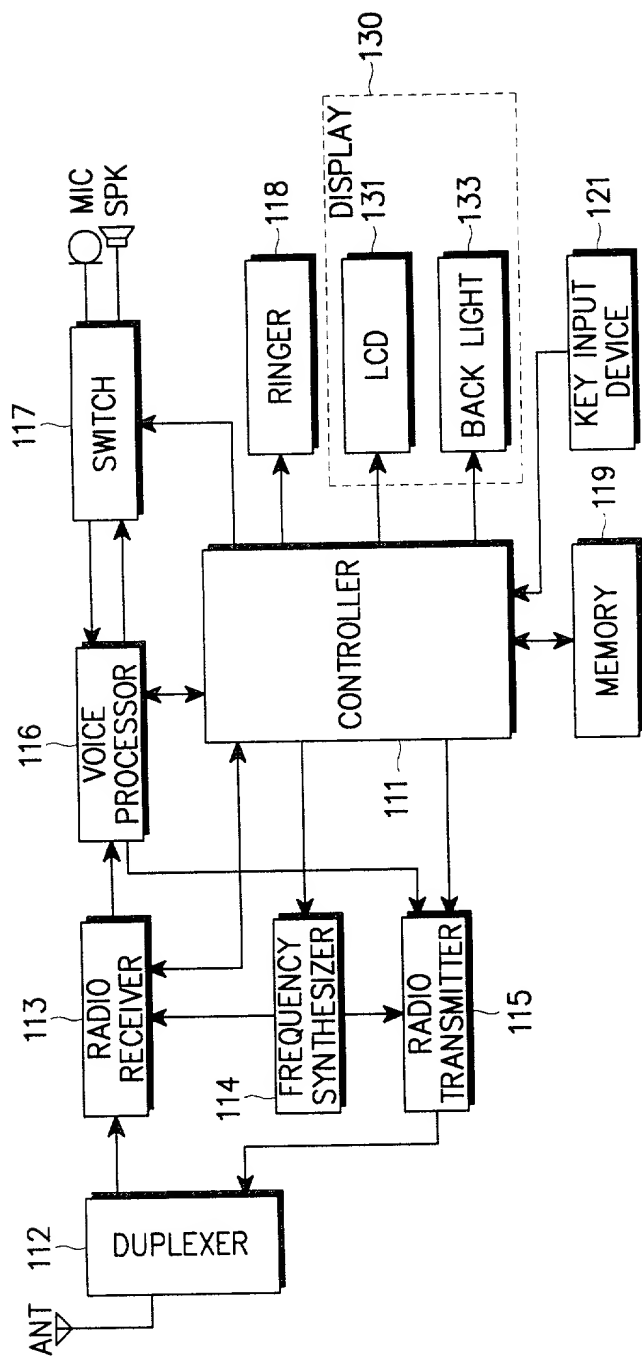
15 6. The method as claimed in Claim 1, further comprising the step of deactivating the power supplied to the display after the expiration of a predetermined time period if the incoming call is received by the portable telephone.

ABSTRACT OF THE DISCLOSURE

A battery saving method of controlling the display of a portable telephone is disclosed. The method comprises checking whether a user inputs a SEND key for a
5 call origination to establish a call or an answering key in response to an incoming call; turning off the power supplied to the display when a call is set up according to the SEND key or the answering key; and, turning on the power supplied to the display when the call is terminated. Further, the display is turned off after a predetermined period of time has elapsed after the SEND key or the answering key is activated.

10

FIG. 1



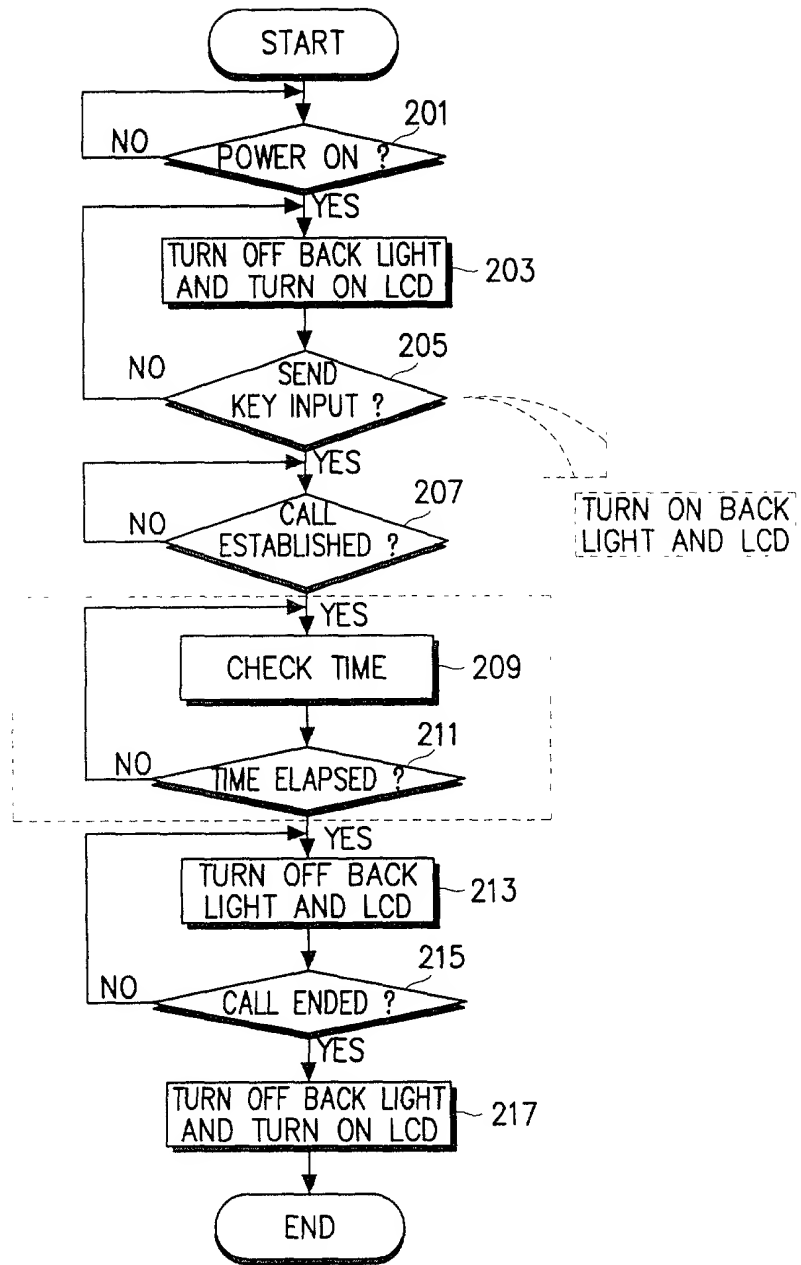


FIG. 2

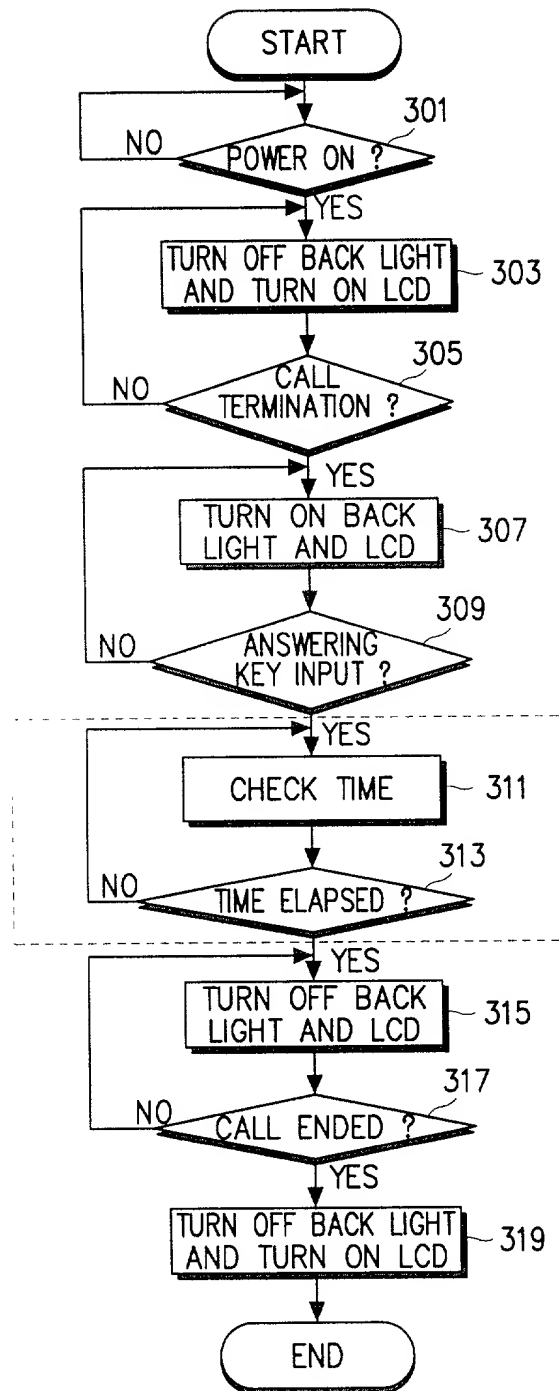


FIG. 3

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Youn-Man Lee

Serial No: *Not yet assigned.*

Examiner: *Not yet assigned.*

Filed: July 21, 2000

Group: *Not yet assigned.*

For: METHOD FOR SAVING BATTERY BY CONTROLLING DISPLAY IN PORTABLE
TELEPHONE.

TRANSMITTAL OF DECLARATION

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

This transmittal accompanies a copy of Declaration without the signature by the inventors, for the above-captioned application. A substitute Declaration with the inventors' signature will be filed upon receipt of the Serial No. for the above-captioned application.

Respectfully submitted,



Steve S. Cha

Attorney for the Applicant
Registration No.: 44,069

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Date: July 21, 2000

DECLARATION AND POWER OF ATTORNEY

As a below named inventor (s), I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

LOW LOSS AWG DEMULTIPLEXER WITH FLAT SPECTRAL RESPONSE

,the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulation, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

<u>1999-29511</u> (Number)	<u>Republic of Korea</u> (Country)	<u>July 21, 1999</u> (Day/Month/Year Filed)	Priority Claimed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of the Title 35, United States Code, §112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulation, §1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

_____ (Application Number)	_____ (Filing Date)	_____ (Status - patented, pending, abandoned)
_____ (Application Number)	_____ (Filing Date)	_____ (Status - patented, pending, abandoned)

POWER OF ATTORNEY: I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: **Steve S. Cha**, Registration No. 44,069; **Howard S. Reiter**, Registration No. 20,394.

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I (we) hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: **Youn-Man Lee**
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Citizenship: Republic of Korea
Date: _____

Singnature: _____

Full name of second inventor:
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Post office address:
Citizenship:
Date: _____

Singnature: _____

Full name of third inventor:

Residence Address:
Post office address:
Citizenship:
Date: _____

Singnature: _____